Systematic review

*Fields that have an **asterisk (*)** next to them means that they **must be answered. Word limits provide guidance** but do not actually limit the number of words that can be entered in each section. You are encouraged to follow maximum length. Registrant means the person filling out the form.*

1. * Review title.

Give the title of the review in English

Cardiac Resynchronization Therapy – predictors of echocardiographic response: Systematic Review

2. Original language title.

For reviews in languages other than English, give the title in the original language. This will be displayed with the English language title.

Terapêutica de Ressincronização Cardíaca - preditores de resposta ecocardiográfica: Revisão Sistemática

3. * Anticipated or actual start date.

Give the date the systematic review started or is expected to start.

01/09/2020

4. * Anticipated completion date.

Give the date by which the review is expected to be completed.

01/02/2021

5. * Stage of review at time of this submission.

Tick the boxes to show which review tasks have been started and which have been completed. Update this field each time any amendments are made to a published record.

Reviews that have started data extraction (at the time of initial submission) are not eligible for inclusion in PROSPERO. If there is later evidence that incorrect status and/or completion date has been supplied, the published PROSPERO record will be marked as retracted.

This field uses answers to initial screening questions. It cannot be edited until after registration.

The review has not yet started: No

Review stage	Started	Completed
Preliminary searches	Yes	No
Piloting of the study selection process	Yes	No
Formal screening of search results against eligibility criteria	Yes	No
Data extraction	No	No
Risk of bias (quality) assessment	Yes	No
Data analysis	No	No

Provide any other relevant information about the stage of the review here.

6. * Named contact.

The named contact is the guarantor for the accuracy of the information in the register record. This may be any member of the review team.

Rodrigo Martins

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:

7. * Named contact email.

Give the electronic email address of the named contact.

rodrigom97@gmail.com

8. Named contact address

Give the full institutional/organisational postal address for the named contact.

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be completed as 'None' if the review is not affiliated to any organisation.

Faculty of Medicine, University of Coimbra

Organisation web address:

11. * Review team members and their organisational affiliations.

Give the personal details and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong. **NOTE: email and country now MUST be entered for each person, unless you are amending a published record.**

Mr Rodrigo Martins. Faculdade de Medicina da Universidade de Coimbra Assistant/Associate
Professor Bárbara Oliveiros. Faculty of Medicine, University of Coimbra Assistant/Associate
Professor Natália António. Faculty of Medicine, University of Coimbra
Professor Helena Donato. Documentation and Scientific Information Service Director, Coimbra University Hospital

12. * Funding sources/sponsors.

Details of the individuals, organizations, groups, companies or other legal entities who have funded or sponsored the review.

No funding was provided for this research.

Grant number(s)

State the funder, grant or award number and the date of award

13. * Conflicts of interest.

List actual or perceived conflicts of interest (financial or academic).

None

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members. **NOTE: email and country must be completed for each person, unless you are amending a published record.**

15. * Review question.

State the review question(s) clearly and precisely. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS or similar where relevant.

Among patients who are eligible for cardiac resynchronization therapy (CRT), which are the specific characteristics of them that can predict, somehow, an echocardiographic response to this therapy?

16. * Searches.

State the sources that will be searched (e.g. Medline). Give the search dates, and any restrictions (e.g. language or publication date). Do NOT enter the full search strategy (it may be provided as a link or attachment below.)

The following databases will be searched: PubMed, The Cochrane Library and EMBASE. In terms of publication dates, studies will be searched from inception to September 1st, 2020. Only studies published in English and Portuguese will be included. The search strategy will include synonymous and MeSH terms considering the intervention assessed on this study (CRT) and predictors of echocardiographic response to CRT.

17. URL to search strategy.

Upload a file with your search strategy, or an example of a search strategy for a specific database, (including the keywords) in pdf or word format. In doing so you are consenting to the file being made publicly accessible. Or provide a URL or link to the strategy. Do NOT provide links to your search **results**.

Alternatively, upload your search strategy to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

Do not make this file publicly available until the review is complete

18. * Condition or domain being studied.

Give a short description of the disease, condition or healthcare domain being studied in your systematic review.

Cardiac resynchronization therapy (CRT) is an option in patients with advanced cardiac heart failure, who do not respond to pharmacological therapy. However, there is evidence that 30 to 40% of the selected patients who undergo CRT do not respond to this therapy as expected. Given this fact, it is important to define predictors of response increasingly precise in order to make the best therapeutical option.

19. * Participants/population.

Specify the participants or populations being studied in the review. The preferred format includes details of both inclusion and exclusion criteria.

Inclusion criteria: adult population (at least 18 years old of age) who underwent cardiac resynchronization therapy.
Exclusion criteria: pediatric population (below 18 years old of age), animal studies.

20. * Intervention(s), exposure(s).

Give full and clear descriptions or definitions of the interventions or the exposures to be reviewed. The preferred format includes details of both inclusion and exclusion criteria.

The intervention taken into account on this systematic review is the cardiac resynchronization therapy (CRT), whether if it is with defibrillator (CRT-D) or without defibrillator (CRT-P).

21. * Comparator(s)/control.

Where relevant, give details of the alternatives against which the intervention/exposure will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.

The comparator group is the group of patients that did not show a positive response to CRT (ideally, it is considered a positive response to CRT a left ventricular volume at end-systole decreasing ≥15% after CRT; other criteria of response to CRT can be considered, if they are clinically relevant).

22. * Types of study to be included.

Give details of the study designs (e.g. RCT) that are eligible for inclusion in the review. The preferred format includes both inclusion and exclusion criteria. If there are no restrictions on the types of study, this should be stated.

It is pretended to assess studies (preferably, randomised controlled trials and cohort studies) that have records of echocardiographic assessment of patients, before (baseline) and after implantation of biventricular pacemaker (which consists in CRT), being considered a positive response to CRT a left ventricular volume at end-systole decreasing ≥15% after CRT, ideally (other criteria can be considered, if they are clinically relevant).It is important that the eligible studies have a statistical analysis between predictors of response to CRT and the considered criterion of response to CRT in the study. Studies can include patients that were aim of other therapeutic interventions in the past (such as right ventricular pacing), or patients that were not.

23. Context.

Give summary details of the setting or other relevant characteristics, which help define the inclusion or exclusion criteria.

24. * Main outcome(s).

Give the pre-specified main (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurement are made, if these are part of the review inclusion criteria.

The objective of this study is to identify specific characteristics of patients (such as gender, possibly), who are eligible for CRT, that can predict the response to it.

* Measures of effect

Please specify the effect measure(s) for you main outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

If possible, a meta-analysis will be made after the conclusion of this systematic review. With that said, it is expected to conduct a logistic regression model regarding which patients' characteristics can predict the response to CRT. Therefore, the effect measures for the mentioned main outcomes will be expressed in odds ratios, with 95% confidence intervals (CIs).

25. * Additional outcome(s).

List the pre-specified additional outcomes of the review, with a similar level of detail to that required for main outcomes. Where there are no additional outcomes please state ‘None’ or ‘Not applicable’ as appropriate to the review

Not applicable.

* Measures of effect

Please specify the effect measure(s) for you additional outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

26. * Data extraction (selection and coding).

Describe how studies will be selected for inclusion. State what data will be extracted or obtained. State how this will be done and recorded.

Regarding study selection, all search results will be screened independently, with one person screening the results and other two people checking the decisions: titles and abstracts of collected citations will be analyzed according to eligibility criteria, in first place; subsequently, the full text of the articles will be assessed in detail, according to eligibility criteria.

Regarding data extraction, it will be made independently, with one person extracting data and other two people checking extracted data. It will include: study design, author and year of the study, sample size, sample relevant characteristics (such as mean age) and definition of response to CRT for each study (other information can be included later, if considered relevant).
Disagreements between individual judgements will be solved by consensus, in both cases. Also, an excel spreadsheet will be created to record all the decisions taken.

27. * Risk of bias (quality) assessment.

State which characteristics of the studies will be assessed and/or any formal risk of bias/quality assessment tools that will be used.

28. * Strategy for data synthesis.

Describe the methods you plan to use to synthesise data. This **must not be generic text** but should be **specific to your review** and describe how the proposed approach will be applied to your data. If meta-analysis is planned, describe the models to be used, methods to explore statistical heterogeneity, and software package to be used.

In first place, a systematic review will be performed, in which a descriptive report of eligible studies' key characteristics, methods and identified predictors will be made. If two or more eligible studies assess the same predictor(s), a meta-analysis will be carried out.

29. * Analysis of subgroups or subsets.

State any planned investigation of 'subgroups'. Be clear and specific about which type of study or participant will be included in each group or covariate investigated. State the planned analytic approach.

In clinical practice, sometimes, it is noticed that some patients have a super-response to CRT (one of the criterion considered is a left ventricular ejection fraction - LVEF - change ≥14, 5%). Therefore, if possible, predictors of response to CRT by patients' response profile are important to assess. One example of the division of this patients' profile can be: super-responder (LVEF change ≥14, 5%), responder (LVEF change 7, 9%-14, 4%) and hypo-responder (LVEF change <7, 9%).

30. * Type and method of review.

Select the type of review, review method and health area from the lists below.

Type of review

Cost effectiveness
No

Diagnostic
No

Epidemiologic
No

Individual patient data (IPD) meta-analysis
No

Intervention
No

Meta-analysis
No

Methodology
No

Narrative synthesis

No

Network meta-analysis
No

Pre-clinical
No

Prevention
No

Prognostic
No

Prospective meta-analysis (PMA)
No

Review of reviews
No

Service delivery
No

Synthesis of qualitative studies
No

Systematic review
Yes

Other
No

Health area of the review

Alcohol/substance misuse/abuse
No

Blood and immune system
No

Cancer
No

Cardiovascular
Yes

Care of the elderly
No

Child health
No

Complementary therapies
No

COVID-19
No

Crime and justice
No

Dental
No

Digestive system
No

Ear, nose and throat
No

Education
No

Endocrine and metabolic disorders
No

Eye disorders
No

General interest
No

Genetics
No

Health inequalities/health equity
No

Infections and infestations
No

International development
No

Mental health and behavioural conditions
No

Musculoskeletal
No

Neurological
No

Nursing
No

Obstetrics and gynaecology
No

Oral health
No

Palliative care
No

Perioperative care
No

Physiotherapy
No

Pregnancy and childbirth
No

Public health (including social determinants of health)
No

Rehabilitation

No

Respiratory disorders
No

Service delivery
No

Skin disorders
No

Social care
No

Surgery
No

Tropical Medicine
No

Urological
No

Wounds, injuries and accidents
No

Violence and abuse
No

31. Language.

Select each language individually to add it to the list below, use the bin icon to remove any added in error.
English
Portuguese-Local

There is an English language summary.

32. * Country.

Select the country in which the review is being carried out. For multi-national collaborations select all the countries involved.

Portugal

33. Other registration details.

Name any other organisation where the systematic review title or protocol is registered (e.g. Campbell, or The Joanna Briggs Institute) together with any unique identification number assigned by them. If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

34. Reference and/or URL for published protocol.

If the protocol for this review is published provide details (authors, title and journal details, preferably in Vancouver format)

Add web link to the published protocol.

Or, upload your published protocol here in pdf format. Note that the upload will be publicly accessible.

No I do not make this file publicly available until the review is complete

Please note that the information required in the PROSPERO registration form must be completed in full even if access to a protocol is given.

35. Dissemination plans.

Do you intend to publish the review on completion?

Yes

Give brief details of plans for communicating review findings.?

36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords help PROSPERO users find your review (keywords do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

37. Details of any existing review of the same topic by the same authors.

If you are registering an update of an existing review give details of the earlier versions and include a full bibliographic reference, if available.

38. * Current review status.

Update review status when the review is completed and when it is published.New registrations must be ongoing.
Please provide anticipated publication date

Review_Ongoing

39. Any additional information.

Provide any other information relevant to the registration of this review.

40. Details of final report/publication(s) or preprints if available.

Leave empty until publication details are available OR you have a link to a preprint. List authors, title and journal details preferably in Vancouver format.

Give the link to the published review or preprint.